

**(43) Date of A Publication 11.12.2002**

**GB 2376 183 A**

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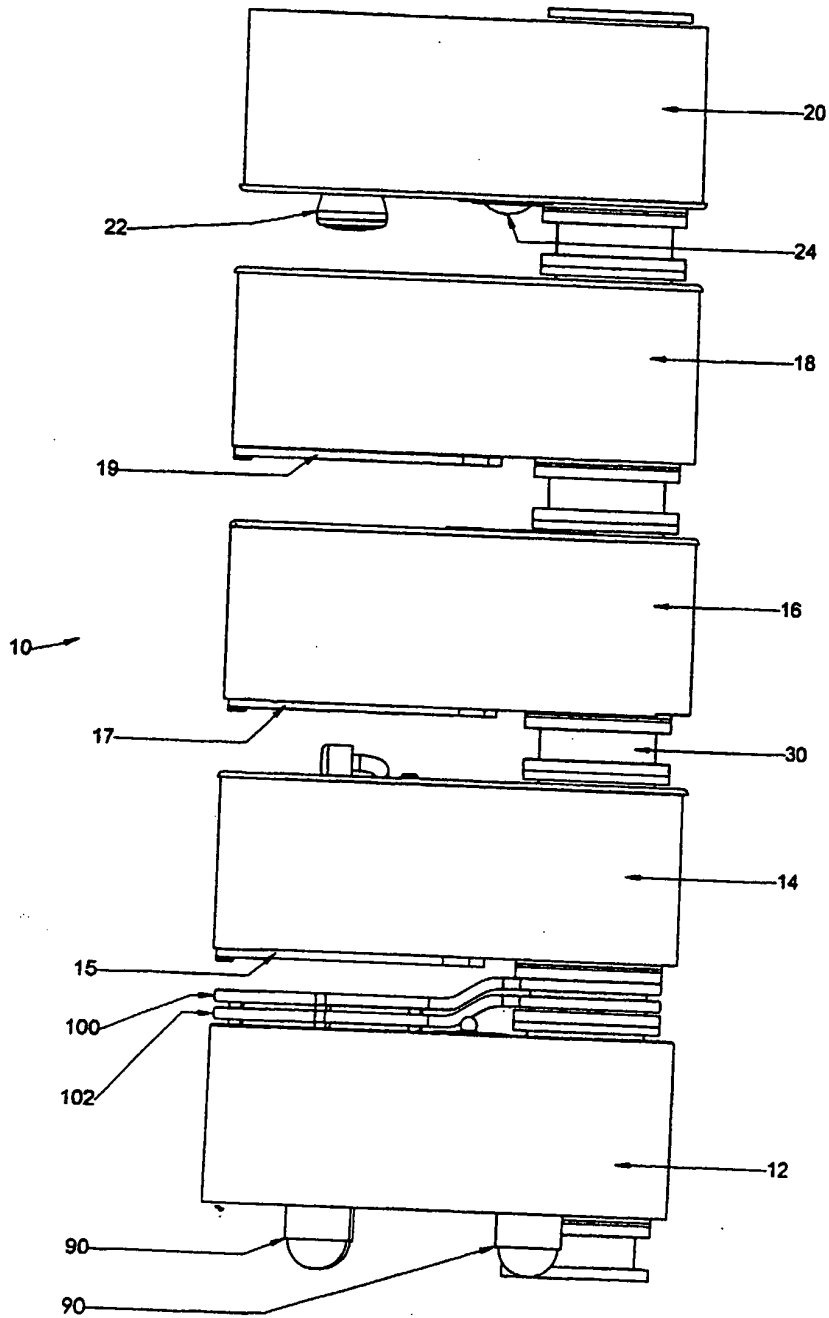


Figure 1



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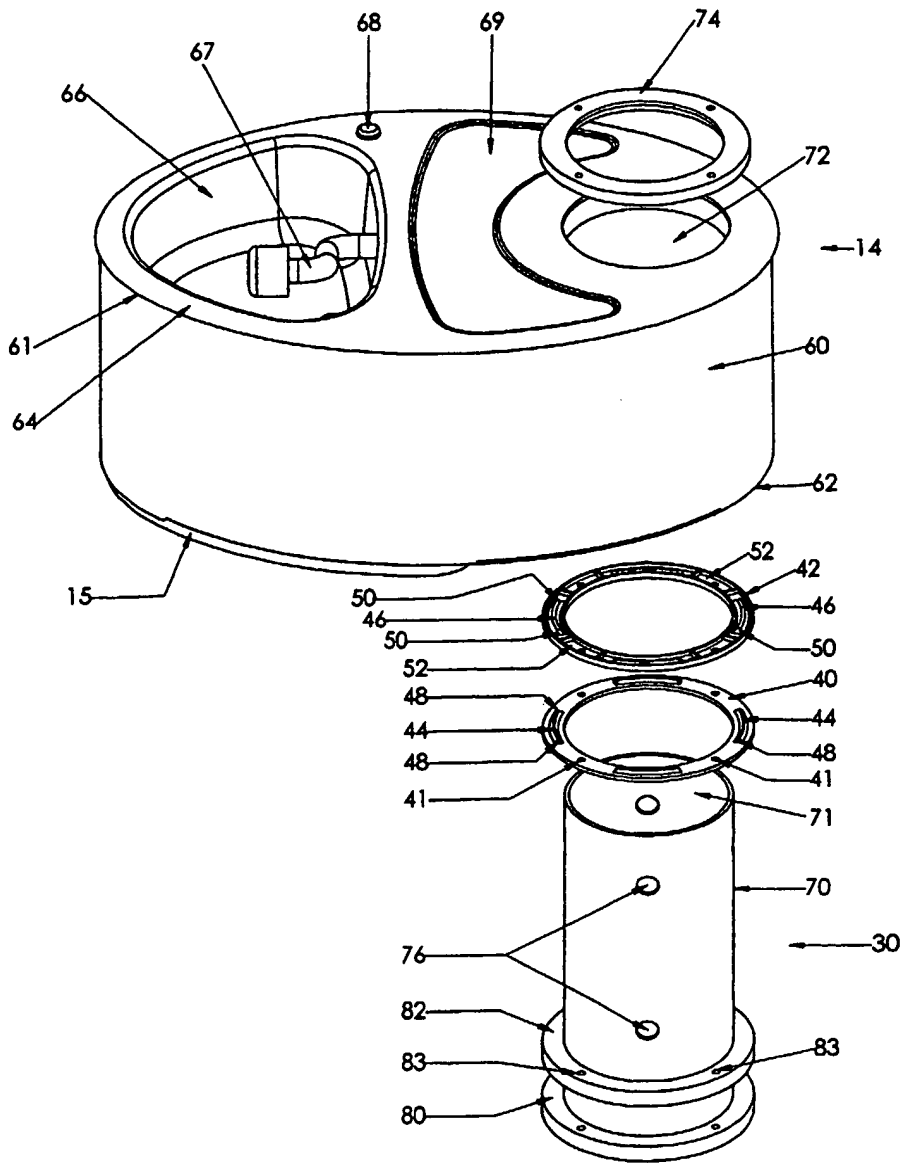


Figure 2

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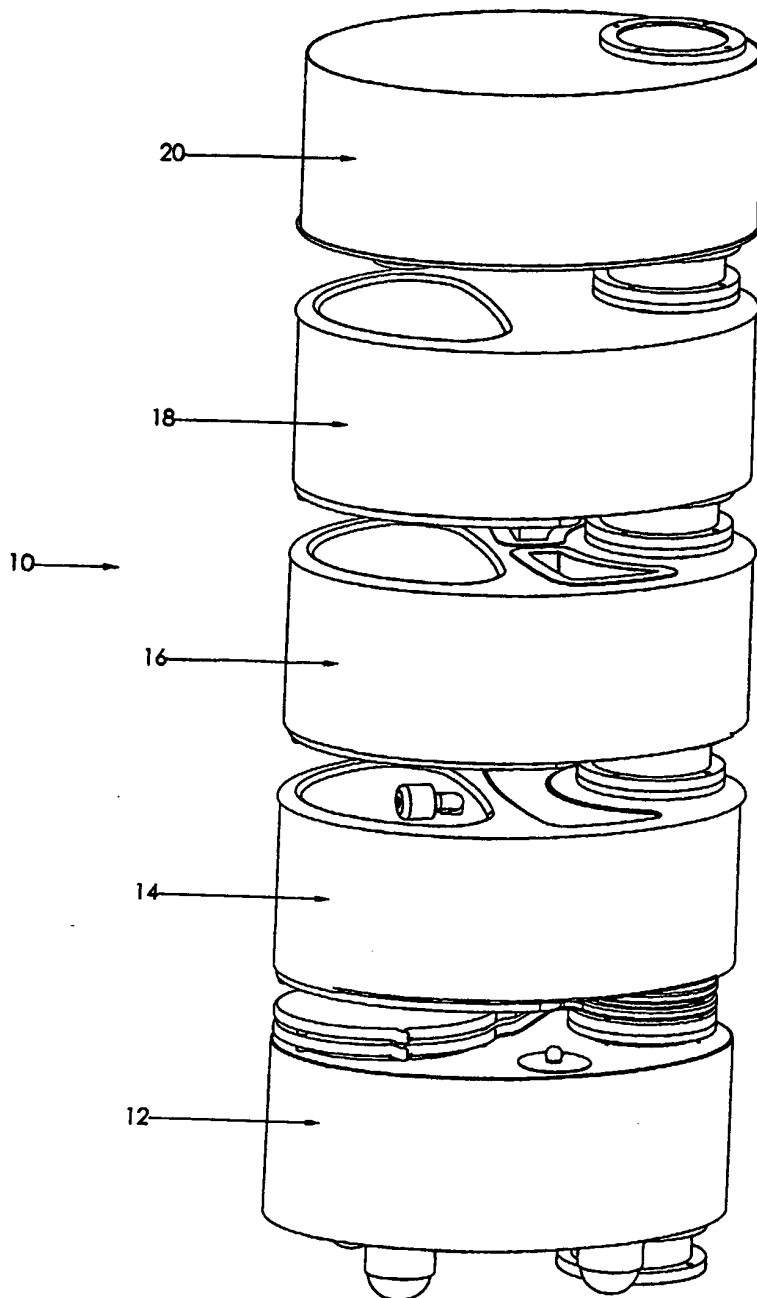


Figure 3

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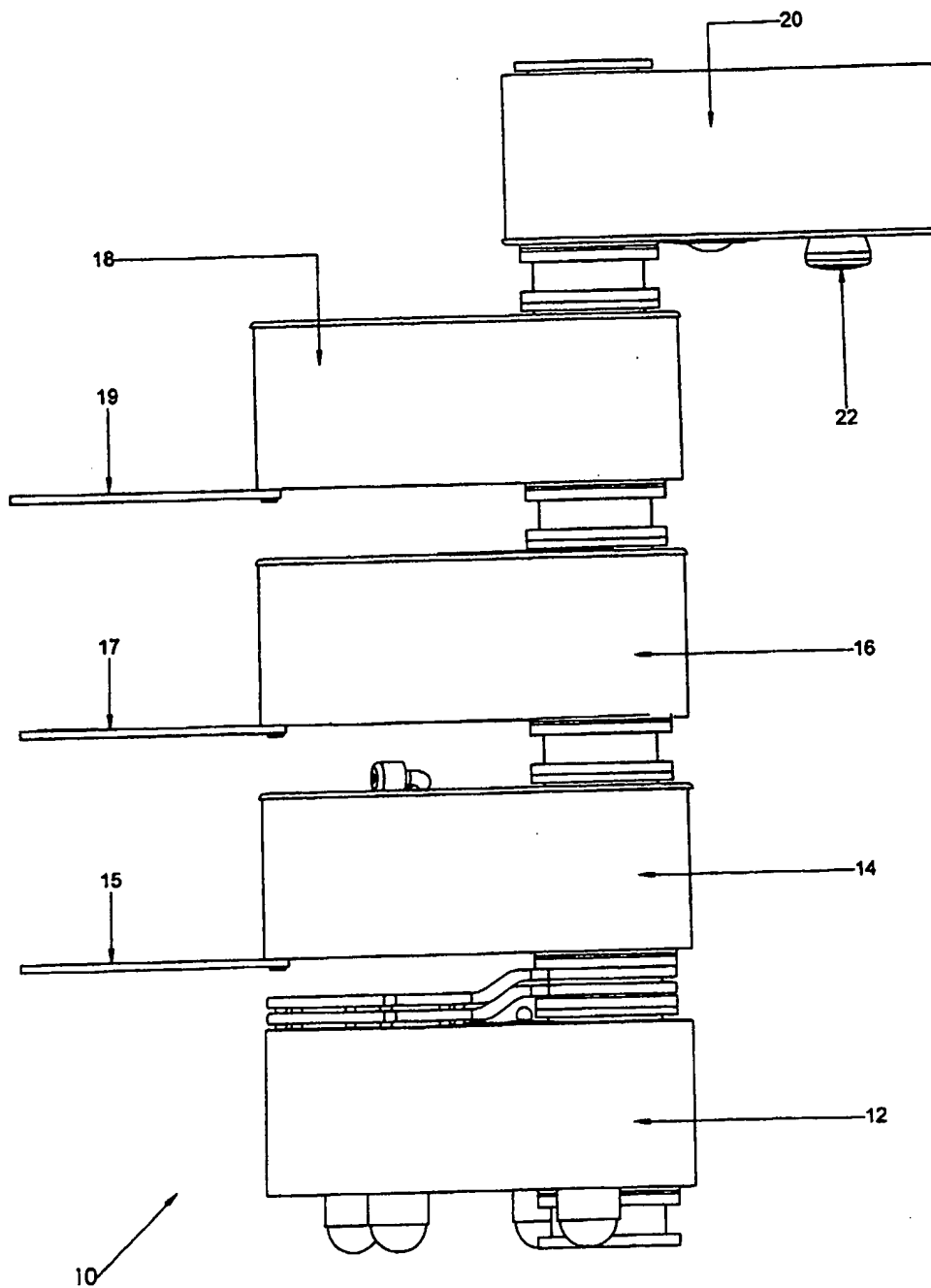


Figure 4

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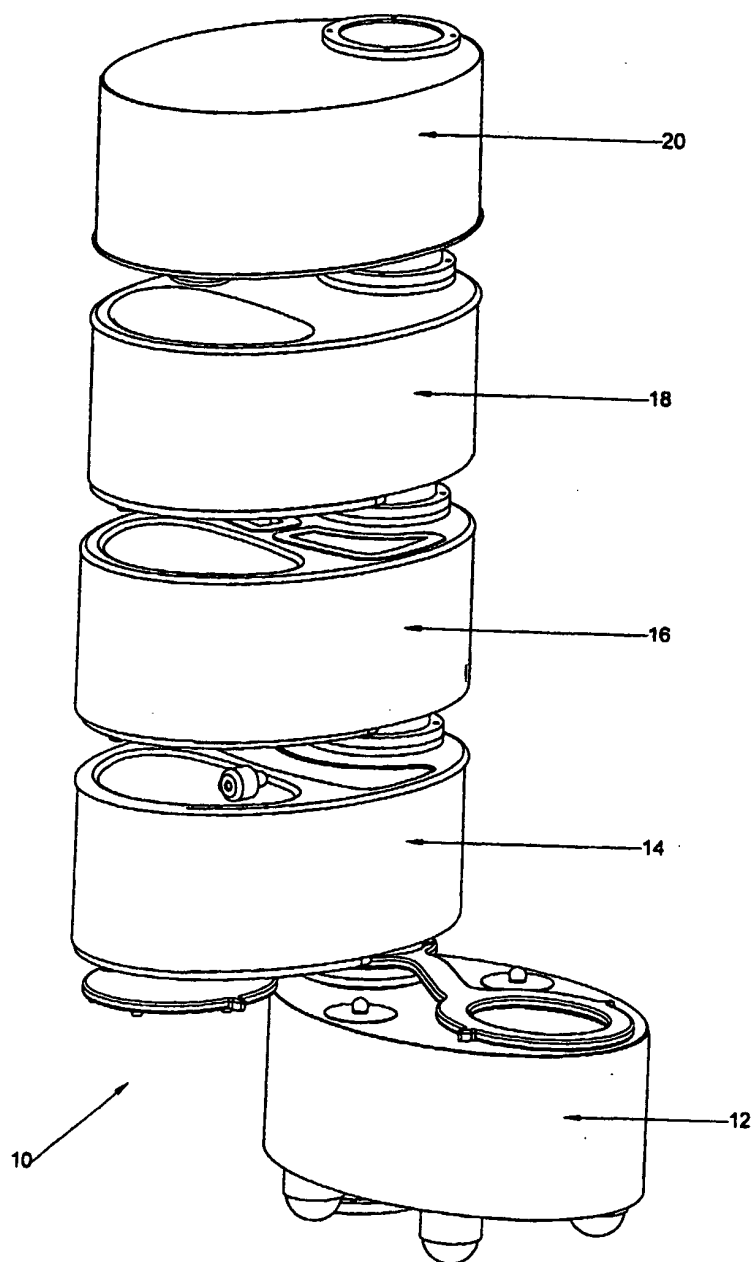


Figure 5



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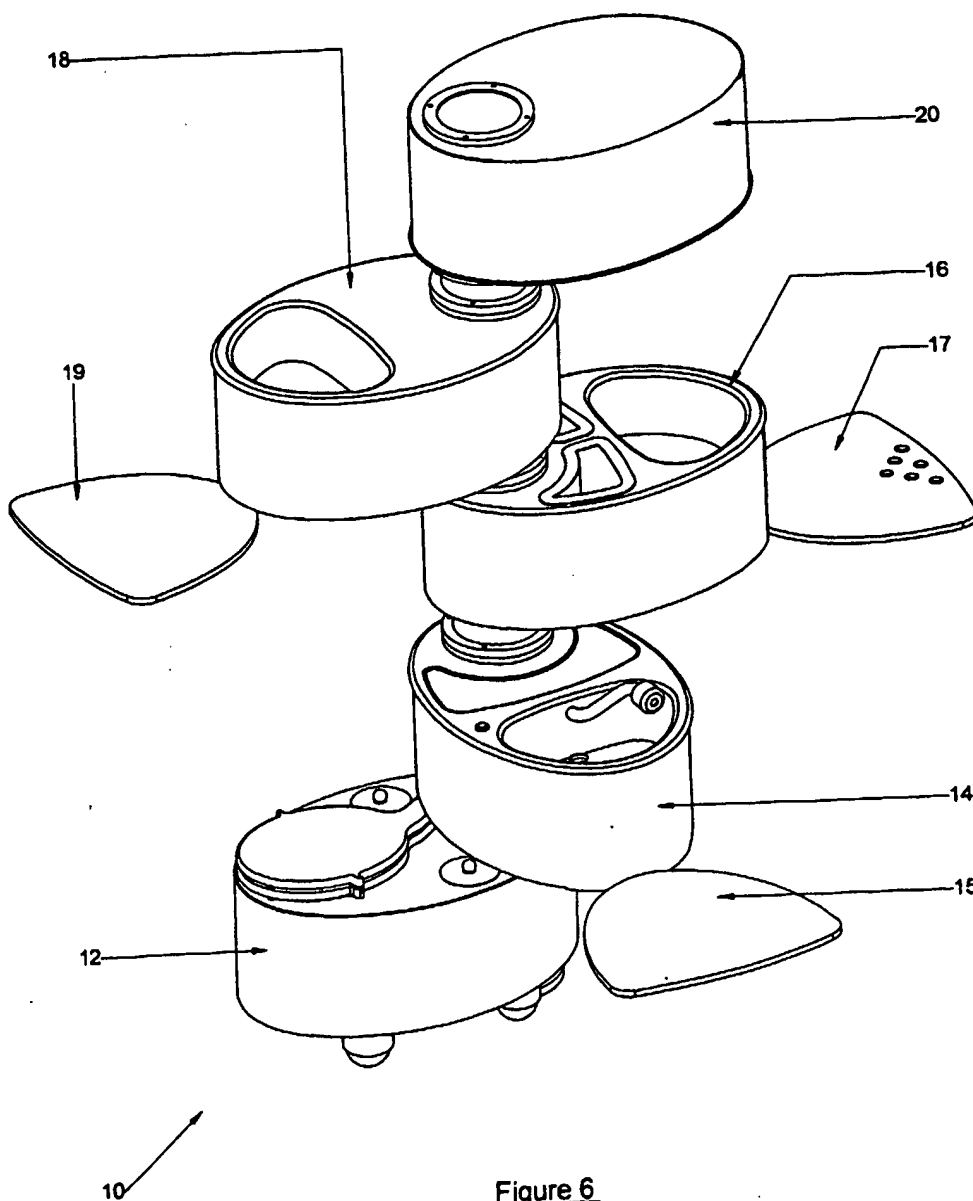


Figure 6

## MODULAR FURNITURE

Field of the Invention

5       The present invention relates to modular furniture and a method of providing furniture.

Background to the Invention

10       Conventional furniture and, in particular, furniture for bathrooms generally comprises a number of items of sanitary apparatus, for example a toilet, a shower, a wash basin. In addition, conventional bathrooms generally provide storage space, for example a bathroom cabinet, in  
15       order to enable items to be stored therein.

          The area provided within bathrooms may be relatively small and, accordingly, the apparatus is carefully located in order to use the space available. In particular,  
20       bathrooms within compact areas for example within caravans, apartments, hotels, student residences, hospital wards etc, must be carefully planned to utilise the space available as efficiently as possible.

25       Furthermore, within a bathroom, only one sanitary apparatus is generally used at any single time and, therefore, the unused sanitary apparatus provides "dead space" or unused space whilst not in use.

30       It is an aim of the present invention to overcome at least one problem associated with the prior art whether referred to herein or otherwise.

### Summary of the Invention

According to a first aspect of the present invention there is provided modular furniture comprising support  
5 means, the support means supporting at least a first furniture module and a second furniture module vertically above the first furniture module, the second furniture module being rotatable about the support means in a substantially horizontal plane relative to the first  
10 furniture module and wherein the support means provides a passageway extending from a support surface to at least one of the furniture modules.

Preferably, the support means provides the passageway.  
15

Preferably the support means supports the furniture modules relative to the support surface.

Preferably the modular furniture comprises modular  
20 bathroom furniture.

The modular furniture may comprise at least three furniture modules or preferably at least four furniture modules and more preferably at least five furniture  
25 modules.

Preferably, each furniture module is rotatable about an identical axis.

30 Preferably, each furniture module is rotatable about the support means.

Preferably, the axis of rotation for each furniture module extends through the furniture module. Preferably, the axis of rotation extends non-centrally through each furniture module. Preferably, the axis of rotation is  
5 spaced from the outer periphery of each furniture module.

Preferably, the modular furniture and more preferably the support means provides a passageway extending from a support surface to two furniture modules and more  
10 preferably three furniture modules.

Preferably, the modular furniture and more preferably the support means provides a passageway extending from a support surface to all of the furniture modules.  
15

Preferably, the support surface comprises a floor and more preferably a bathroom floor.

The support surface may comprises a ceiling and may  
20 comprise a bathroom ceiling.

The support surface may comprise a sloped bathroom floor. Preferably, the sloped bathroom floor slopes towards drainage means. Preferably the sloped bathroom  
25 floor does not have an upwardly projecting periphery defined there around.

Preferably at least one of the furniture modules comprises sanitary apparatus. Preferably two or three  
30 furniture modules comprises sanitary apparatus.

One of the furniture modules may comprise a toilet or a shower head or a storage unit or a wash basin or an extractor fan or a light.

5        Preferably, in use, a vertically uppermost furniture module comprises a shower head.

Preferably, in use, a vertically lowermost furniture module comprises a toilet.

10

Preferably the support means comprises a support column. Preferably the support column is arranged, in use, to project upwardly from a floor. Preferably the support column is arranged, in use, to extend downwardly  
15 from a ceiling. Preferably the support column is arranged, in use, to extend from a floor up to a ceiling.

The support column may comprise a plurality of discrete column sections.

20

Preferably, the support column is substantially cylindrical providing a passageway therethrough.

Preferably, the passageway is arranged to extend  
25 through each furniture module.

Preferably each furniture module is rotatably or pivotally mounted to the support means.

30        Preferably each furniture module is rotatable about the support means independently from the other furniture modules.

Preferably each furniture module is rotatable about 180° around the support means.

Preferably each furniture module comprises an  
5 identically shaped outer surface.

Preferably each furniture module is substantially cylindrical having a first end, a second end and an outer surface.

10

Preferably each furniture module comprises an elliptic cylinder.

Preferably the outer dimensions of each furniture  
15 module are substantially identical.

Preferably the support means is arranged to extend through each elliptic cylinder. Preferably the support means is arranged to extend through each elliptic cylinder  
20 at a location spaced from the centre and towards one end of each elliptic cylinder.

Preferably the modular furniture comprises a free standing unit which requires no connection with the wall  
25 of a room.

Vertically adjacent furniture modules may be physically spaced from each other and may be spaced from each other by greater than 1cm and may be spaced from each  
30 other by greater than 3cm.

According to a second aspect of the present invention there is provided an item of modular furniture comprising

support means, a first furniture module and a second furniture module, the support means being arranged, in use, to support the first furniture module adjacent to the second furniture module in a first direction, the second  
5 furniture module being rotatable about the support means in a plane substantially perpendicular to the first direction and wherein the item of modular furniture provides a passageway from a support surface to at least one of the furniture modules.

10

Preferably the first direction is substantially vertical.

Preferably the plane is substantially horizontal.

15

According to a third aspect of the present invention, there is provided a method of providing furniture comprising providing modular furniture in accordance with the first aspect of the present invention and rotating the  
20 first furniture module relative to the second furniture module in a substantially horizontal plane.

According to a fourth aspect of the present invention there is provided a kit for assembly into an item of  
25 modular furniture, the modular furniture being in accordance with the first or third aspects of the present invention.

#### Brief Description of the Drawings

30

The present invention will now be described by way of example only with reference to the drawings that follow, in which:



Figure 1 is a side view of an embodiment of the present invention.

5 Figure 2 is an exploded perspective view of part of an embodiment of the present invention.

Figure 3 is a side perspective view of an embodiment of the present invention.

10

Figure 4 is a side perspective view of an embodiment of the present invention.

Figure 5 is a side perspective view of an embodiment  
15 of the present invention.

Figure 6 is a perspective view of an embodiment of the present invention.

20 Description of the Preferred Embodiments

As shown in Figure 1, the item of modular furniture 10 comprises a plurality of individual furniture modules 12, 14, 16, 18, 20 and preferably comprises five furniture  
25 modules. The furniture modules 12, 14, 16, 18, 20 comprises sanitary apparatus, for example items of sanitary furniture. In the preferred embodiment, the lowermost furniture module 12 comprises a toilet, the second furniture module 14 comprises a wash basin or a  
30 sink, the third furniture module 16 comprises a product storage area, the fourth furniture module 18 comprises a towel storage area and the uppermost fifth furniture module 20 comprises a shower unit. The shower unit

comprises a shower head 22 and may further comprise an extractor fan and a light 24.

The modular furniture 10 comprises support means in the form of a support column 30. The support column 30 is arranged to support all of the furniture modules 12, 14, 16, 18, 20 vertically spaced relative to each other. Vertically adjacent furniture modules may be spaced such that an upper surface of the lower furniture module locates adjacent to the lower surface of the upper furniture module. In a preferred embodiment, vertically adjacent furniture modules may be physically spaced by greater than 1cm and preferably by greater than 3cm. However, in an alternative embodiment the furniture modules may be vertically spaced adjacent to each other by less than 5mm or less than 2mm in order to appear seamless. Furthermore, the vertical spacing may cause the upper surface of the lower furniture module to locate next to the lower surface of the upper furniture module to appear seamless. The furniture modules 12, 14, 16, 18, 20 are rotatably supported by the support column 30 such that the furniture modules 12, 14, 16, 18, 20 are movable in a horizontal plane relative to each other. The support column 30 is supported on a support surface, for example a bathroom floor and/or a bathroom ceiling.

Only one furniture module may be required at any single time and, therefore, all of the remaining furniture modules may be vertically aligned in order to provide as much space as possible for the user, as shown in Figure 4 and Figure 5. The modular furniture 10 is for use in bathrooms and, in particular, compact bathrooms in which it is useful to utilise the available space as efficiently

as possible, for example in caravans or in public  
bathrooms which may be located within public areas, for  
example at airports or train stations. In addition,  
compact bathrooms to save space and hence costs may also  
5 be provided in apartments, hotels, student residences,  
hospital wards, etc.

In bathrooms it is known to provide a sloping floor  
surface directed towards a drainage means or a drainage  
10 area. Such bathrooms do not require shower trays which  
have a raised periphery defined there around.  
Conventional showers generally include shower trays which  
are permanently provided with the shower head permanently  
provided vertically thereabove. Accordingly, the use of a  
15 shower tray restricts space and inhibits the use of the  
available space within the bathroom. The use of a sloped  
floor enables the uppermost furniture module 20 to be  
simply rotated out of alignment with the other furniture  
modules 12, 14, 16, 18 in order to provide a shower with  
20 the water draining naturally into the drainage means  
rather than requiring a floor mounted shower tray. This  
subsequently enables the sink unit 12 for example to then  
be rotated out of alignment for use by a user and the user  
is therefore not required to stand in a shower tray.

25 Each furniture module 12, 14, 16, 18, 20 comprises an  
elliptic cylinder housing. The support column is arranged  
to extend through each furniture module 12, 14, 16, 18,  
20, at a location adjacent to one end of the each elliptic  
30 cylinder rather than centrally through each elliptic  
cylinder. The support column 30 is arranged to extend  
upwardly from the floor and may connect to the ceiling in  
the bathroom. Accordingly, the modular furniture is a

free standing unit with no support or attachments to the walls required. This further enables the walls to be decorated with shelves, heaters or mirrors etc.

5 Each furniture module 12, 14, 16, 18, 20 is arranged to rotate through substantially 180° around the support column 30. For example, from an aligned position, as shown in figure 1 and Figure 3 each furniture module 12, 14, 16, 18, 20 may be rotatable by 90° in a clockwise  
10 direction and 90° in an anti-clockwise direction. In an alternative embodiment the furniture modules may be rotatable about the full 360°.

Each furniture module 12, 14, 16, 18, 20, is  
15 substantially identical but may provide a different function, for example, a shower, a washbasin, a toilet, a cabinet etc. Each furniture module comprises an elliptic cylinder housing. The module is completed by an insert to provide the furniture, for example a washbasin insert etc.  
20 The insert may comprise moulded inserts.

The second furniture module 14 will now be described in more detail with particular reference to Figure 2 although it should be appreciated that each furniture  
25 module comprises substantially identical apparatus differing in the function provided as a result of the insert located with the elliptic cylinder housing.

The second furniture module 14 comprises an elliptic  
30 cylinder housing 60 housing an upper open face 61 and a lower closed face 62. The elliptic cylinder housing 60 is arranged to have an insert 64 in order to provide the functional apparatus. The second furniture module 14

comprises a wash basin insert defining a basin 66, having a tap 67 with a control button 68 associated therewith and a support area 69 for supporting soap etc. In one embodiment the control button 68 may be replaced with or  
5 supplemented with a sensor to automatically turn the water on or off as a users hands are placed or removed from underneath the tap. As previously explained, the other furniture modules have different inserts to provide different equipment for example a shower insert (in which  
10 the elliptic cylinder housing has an open lower face) or a toilet insert, or a storage insert, etc.

The second furniture module 14 is supported to the support column 30 through a hinge mechanism. In the  
15 preferred embodiment, the furniture module comprises a rising hinge mechanism such that as the furniture module 14 is rotated the furniture module 14 rises upwardly. In alternative embodiments, the rising hinge mechanism may be replaced with ball bearing devices enabling the furniture  
20 modules to rotate around the support column.

The hinge mechanism comprises a male annular member 40 and a female annular member 42. The female annular member 42 is arranged to be secured to a lower face 62 of the  
25 furniture module 60 and the male annular member 40 is arranged to be secured to the support column 30.

The lower face of the female annular member 42 is arranged to co-operate with the upper face of the male  
30 annular member 40. The male annular member 40 comprises raised arcuate sections 44 defined thereon. Similarly the female annular member 44 comprises corresponding recessed arcuate sections 46. In the neutral position each arcuate

raised section 44 locates in a corresponding recessed arcuate section 46.

5 The ends of the raised arcuate sections 44 comprise ramped portions 48. Similarly the ends of the recessed arcuate sections 46 comprises ramped portions 50. From the neutral position, the furniture module 14 is manually rotated such that the raised portions 48, 50 slidably move relative to each other in order to raise the module 14  
10 whilst being rotated. The hinge mechanism preferably comprises limiting means in order to prevent greater than 90° of rotation from the neutral position. In the maximum rotated position each raised portion 44 is supported on a corresponding support surface 52 provided by the female  
15 annular member 42.

The support column 30 comprises discrete sections 70 which extend between vertically adjacent furniture modules. The furniture module 14 provides a passageway 72  
20 to enable the discrete column section 70 to locate therein. Accordingly, at least a part of the discrete column section is arranged to extend into the passageway 72 provided by the furniture module 14.

25 The discrete column section 70 is provided with a first outwardly projecting flange 80 and a second outwardly projecting flange 82. The male annular member 40 is arranged to be secured to the second projecting flange 82 and may be secured thereto by suitable locking  
30 elements projecting through locking apertures 41, 83 for example a nut and bolt.

The upper end of the discrete column section 70 projects through the upper face 64 of the furniture module 14 and locates within the passageway 72 provided by the furniture module 14.

5

A support column cap 74 may be secured adjacent to the upper face of the discrete column section 70. The support column cap 74 is arranged to be secured to the first annular flange 80 of the discrete column extension 70  
10 extending upwardly from the furniture module 14.

Once constructed, the support column 30 defines a passageway 71 therethrough from the floor upwards. All of the plumbing and wiring is arranged to locate within the  
15 passageway 71. For example, the passageway 71 may contain hot and cold water pipes, electrical wiring for any heaters, lighting, electric shower, extractor fan as well as the waste water pipes for the wash basin and the toilet.

20

The discrete column sections 70 have apertures 76 defined therein in order to enable the pipes, wiring etc. to connect to the relevant apparatus. The pipes are flexible in order to allow the rotation of the modules.

25

The modular furniture 10 may have switches mounted thereon in order to operate the shower, heater, lighting, extractor fan. The switches may be located at a convenient height to be operated manually since such  
30 electrical items located on the uppermost furniture module may be relatively inaccessible due to the height of the furniture module.

The lowermost furniture module 12, the toilet, may comprise auxiliary support members in the form of feet 90 in order to provide extra support since this furniture module will need to support the greatest load. The feet  
5 90 may comprise castors or other rolling support members in order for the toilet to be rotated about the support column 30. Furthermore, the feet 90 may be arranged to simultaneously extend as the toilet module 12 is rotated in order to accommodate the rising hinge mechanism for  
10 example resilient means or compression springs may force the rolling support downwardly in order to maintain the feet 90 in contact with the floor whilst being rotated. Alternatively, a non-rising hinge mechanism may be used with the lowermost furniture module and/or the uppermost  
15 furniture module.

The furniture modules 12, 14, 16, 18, 20 may be provided with shelves 15, 17, 19 which are arranged to pivot or rotate outwardly from the underside of the  
20 furniture module as shown in figures 1, 4 and 6. For example, a shelf may be secured to the second end of the underside of the elliptic cylinder and can then be manually rotated to project outwardly from the elliptic cylinder. Accordingly, whilst not in use, the shelves 15,  
25 17, 19 are concealed without requiring significant space.

In addition, the toilet lid 100 and toilet seat 102 are also pivotally supported by the support column 30 in order to rotate within a horizontal plane. If the toilet  
30 lid 100 or toilet seat 102 are not required then they can be rotated to locate underneath the second furniture module 14, as shown in Figure 5.

The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

**Claims**

1. Modular furniture comprising support means, the support means supporting at least a first furniture module  
5 and a second furniture module vertically above the first furniture module, the second furniture module being rotatable about the support means in a substantially horizontal plane relative to the first furniture module and wherein the modular furniture comprises a passageway  
10 extending from a support surface to at least one of the furniture modules.
2. Modular furniture according to claim 1 in which the support means provides the passageway.
- 15 3. Modular furniture according to claim 1 or claim 2 in which the modular furniture comprises modular bathroom furniture.
- 20 4. Modular furniture according to any preceding claim in which the modular furniture comprises at least five furniture modules.
5. Modular furniture according to any preceding claim in  
25 which each furniture module is rotatable about an identical axis.
6. Modular furniture according to any preceding claim each furniture module is rotatable about the support  
30 means.

7. Modular furniture according to any preceding claim in which the axis of rotation for each furniture module extends through the furniture module.
- 5 8. Modular furniture according to claim 7 in which the axis of rotation extends non-centrally through each furniture module.
9. Modular furniture according to claim 7 or claim 8 in  
10 which the axis of rotation is spaced from the outer periphery of each furniture module.
10. Modular furniture according to any preceding claim in which the modular furniture provides a passageway  
15 extending from a support surface to two furniture modules.
11. Modular furniture according to any preceding claim in which the modular furniture provides a passageway extending from a support surface to all of the furniture  
20 modules.
12. Modular furniture according to any preceding claim in which the support surface comprises a floor.
- 25 13. Modular furniture according to claim 12 in which the support surface comprises a sloped bathroom floor.
14. Modular furniture according to any preceding claim in which at least one of the furniture modules comprises  
30 sanitary apparatus.
15. Modular furniture according to claim 14 in which one of the furniture modules comprises a toilet.

16. Modular furniture according to claim 14 or claim 15 in which one of the furniture modules comprises a showerhead

5 17. Modular furniture according to any one of claims 14 to 16 in which one of the furniture modules comprises a wash basin.

10 18. Modular furniture according to any preceding claim in which, in use, a vertically uppermost furniture module comprises a shower head.

15 19. Modular furniture according to any preceding claim in which, in use, a vertically lowermost furniture module comprises a toilet.

20. Modular furniture according to any preceding claim in which the support means comprises a support column.

20 21. Modular furniture according to claim 20, in which the support column is arranged, in use, to project upwardly from a floor.

25 22. Modular furniture according to claim 20 or claim 21 in which the support column is arranged, in use, to extend from a floor up to a ceiling.

30 23. Modular furniture according to any one of claims 20 to 22 in which the support column is substantially cylindrical providing a passageway therethrough.

24. Modular furniture according to any preceding claim, in which the passageway is arranged to extend through each furniture module.

5 25. Modular furniture according to any preceding claim, in which each furniture module is rotatable about the support means independently from the other furniture modules.

26. Modular furniture according to any preceding claim, in  
10 which each furniture module is substantially cylindrical having a first end, a second end and an outer surface.

27. Modular furniture according to any preceding claim, in  
15 which each furniture module comprises an elliptic cylinder.

28. Modular furniture according to any preceding claim, in which the outer dimensions of each furniture module are substantially identical.  
20

29. Modular furniture according to any preceding claim in which the modular furniture comprises a free standing unit which requires no connection with the wall of a room.

25 30. An item of modular furniture comprising support means, a first furniture module and a second furniture module, the support means being arranged, in use, to support the first furniture module adjacent to the second furniture module in a first direction, the second furniture module  
30 being rotatable about the support means in a plane substantially perpendicular to the first direction and wherein the item of modular furniture provides a

passageway from a support surface to at least one of the furniture modules.

31. An item of modular furniture according to claim 30, in  
5 which the first direction is substantially vertical.

32. An item of modular furniture according to claim 30 or claim 31, in which the plane is substantially horizontal.

10 33. A method of providing furniture comprising providing modular furniture in accordance with any one of claims 1 to 32 and rotating the first furniture module relative to the second furniture module in a substantially horizontal plane.

15

34. Modular furniture substantially as herein described with reference to, and as shown in, any of the accompanying drawings.

20 35. A method of providing furniture substantially as herein described with reference to, and as shown in, any of the accompanying drawings.

36. A kit substantially as herein described with reference  
25 to, and as shown in, any of the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0213026.8  
Claims searched: 1-36

21

Examiner: D. Haworth  
Date of search: 2 October 2002

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): A4B (B9F2); A4N (NSB); E1C (C39)

Int Cl (Ed.7): A47K 3/28, 4/00; A47B 49/00

Other: Online: WPI, EPODOC, PAJ

### Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	EP 0091340 A (Revel)	1-36

- |   |                                                                                                           |   |                                                                                                                  |
|---|-----------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------|
| X | Document indicating lack of novelty or inventive step                                                     | A | Document indicating technological background and/or state of the art.                                            |
| Y | Document indicating lack of inventive step if combined with one or more other documents of same category. | P | Document published on or after the declared priority date but before the filing date of this invention.          |
| & | Member of the same patent family                                                                          | E | Patent document published on or after, but with priority date earlier than, the filing date of this application. |